TRADITIONAL BREEDING SYSTEMS IN SMALLHOLDER RURAL POULTRY IN MALAWI

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INTRODUCTION

Human population in Malawi constitutes 86 % living in rural areas as smallholder farmers. The majority of the rural population (60 %) are food insecure and consuming approximately less than 6.0 kg per capita animal protein. Education levels are low and 87 % of per capita income is spent on food (NSO, 2000). Rural poultry production is characterised by free – range, scavenging production systems, low inputs in terms of feed supplements, disease and parasite control, and hence subsequent low production and high mortality rate. Mostly indigenous species are used. Improvement of productivity in rural poultry will contribute to alleviation of nutritional deficiencies and rural poverty. While most of the constraints have been described from surveys and limited on-station and on-farm studies (Ahlers, 1999 ; Gondwe *et al*., 2000 ; Küttner *et al.*, 2001), traditional breeding practices have often been left out. Including traditional breeding technologies in improvement strategies by way of enhancing and mitigating positive and negative effects, respectively, will have added advantages over and above mere intervention in known constraints. This paper explains some indicators of traditional breeding practices, and their potential impact on diversity in rural poultry. Possibilities of incorporating such breeding practices in current programs are highlighted.

MATERIALS AND METHODS

Most data originate from surveys carried out on farmers in rural areas of Lilongwe and Mzuzu Agricultural Development Divisions (ADD) between 1998 and 2000. Mzuzu ADD is in the Northern Malawi, with two agro-ecological zones ; high areas of low temperatures (annual average, 19.4°C) and high annual rainfall (> 1500 mm) ; and medium altitude areas (1000 – 1500 m asl) with moderate temperatures (annual average, 20.5°C) and annual rainfall (> 1000 ≤ 1500 mm). Lilongwe ADD is characterised by an average annual temperature of 20.7^{0}C and 1000 to 1500 mm of rainfall in a normal year. A survey among smallholder farmers was conducted and questions regarding exchange and sources of breed stock materials and reasons behind were asked. Random weights of poultry were taken and age was estimated by farmers. Analysis of variance was carried out. A flock monitoring census was initiated for Mkwinda in Lilongwe ADD. Lorenz curves were computed from cumulative frequency distribution. Gini coefficients, a measure of equity of distribution, were calculated from the areas under the curves.

RESULTS AND DISCUSSION

Distribution of rural poultry. Results from household flock monitoring census in Mkwinda, Lilongwe ADD are presented (figure 1). Poultry distribution is more equitable among households (Gini Coefficient, 0.49), seconded by goats (0.67), while cattle distribution (0.94) is skewed to few individuals. Other species include rabbits and sheep with similarly high Gini coefficient of 0.95. The more equitable distribution of small livestock species such as poultry and goats characterise their subsistence oriented nutritional, social and economic values among these farmers (Gondwe *et al*., 1999 ; Küttner *et al*., 2001).

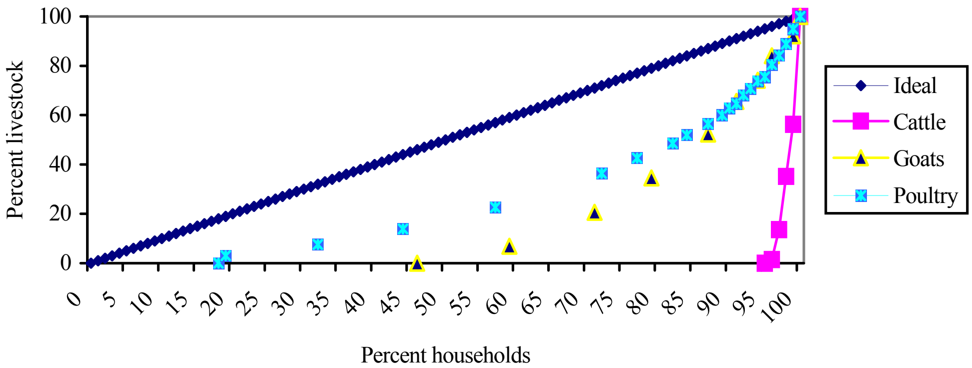

Figure 1. Lorenz Curves for distribution of poultry and livestock species among households in Lilongwe ADD (n = 752 households)

Traditional poultry breeding practices in Malawi. Results from data of Mzuzu and Lilongwe ADDs showed that farmers exchanged or shared their breed stock, among relatives and friends within the village, which consists of up to 200 households (table 1). Little monetary transaction took place, the majority using non-cash sharing systems, locally called *Chipazga* or *Chakhola*. This is a social loan without any security guarantee where the sharer expects a return of the female bird or pair of pigeons. The offspring is shared between the two farmers in agreed proportions. Male birds for breeding are usually borrowed for a mating period. With this system, farmers (n = 323) are guaranteed cheap (31 % of respondents) and easy acquisition of breed stock (7.2 %). This stock sharing system contributes through distribution of female breeding stock to the observed high equity distribution of poultry in rural areas. Animals for breeding are also exchanged, though of less importance, between neighbouring villages and at the market (table1). Different phenotypes exist in rural flocks (Gondwe *et al.,* 1999). Traditionally farmers acquire breeding animals, which are phenotypically different to their own stock (29 % of respondents). For example, farmers associated chicken phenotypes *Simboti* (dwarf) and *Kachibudu* (rampless feathers) with higher reproductive performance (egg laying and mothering ability). However, this observation has not been validated yet. The stock sharing system is also used to acquire new breed stock after disease outbreaks mainly in chicken (29 % of respondents).
Uncontrolled mating is practiced in rural chickens and ducks (100 % of respondents), while pigeons mate in pairs arising from the same clutch. The stock exchange system is determined by phenotype preferences and social – cultural relationship among households.

Table 1. Sources of breed stocks for poultry among farmers in rural areas (n = 323)

Source		Frequency of farmers (%)		
		Chickens	Ducks	Pigeons
Within the village	LADD	54.8	78.0	79.4
	MZADD	75.2	77.3	81.2
Market places	LADD	13.8	4.9	1.6
	MZADD	4.0	9.1	1.2
Outside Villages	LADD	31.3	17.1	19.0
	MZADD	20.8	13.6	17.7

Contribution to rural poultry diversity. Together with feeding and disease management practices, traditional breeding practices have maintained flock phenotypic diversity, shown by high coefficients of variation. For example, live weights of chicken showed high coefficients in all age groups (chicks, females 71.8 %, males 44.6 % at six weeks of age ; layers, 68.8 % and cocks, 87.1 % at 24 weeks of age ; mature hens, 55.1 % and cocks, 61.5 % at about 2 years of age). Table 2 shows least square means and coefficients of variation for reproductive traits, which indicates significant differences between locations for some parameters and a high phenotypic variation.

Table 2. Estimated means and diversity indices (CV %) for different reproduction traits in rural chickens, Lilongwe ADD and Mzuzu ADD, Malawi (n = number of birds observed from 323 households)

Trait	Lilongwe ADD			Mzuzu ADD		
	n	LSMean (SE)	CV	n	LSMean(SE)	CV
Age to point of lay, wks***	190	25.6 (0.67)	33.9	145	30.0 (0.78)	33.8
No of eggs per clutch, laid	209	14.9 (0.24)	22.5	146	14.7 (0.29)	25.3
No of eggs per clutch, sit***	133	13.1 (0.26)	20.5	263	12.3 (0.19)	24.5
Hatchability, %***	119	89.7 (1.30)	9.5	243	81.1 (0.90)	21.1
No of clutches per year	205	3.1 (0.05)	20.8	146	3.0 (0.06)	21.9

Note : different clutches combined ; *** significant differences between ADDs ($P < 0.01$)

CONCLUSION

Traditional breeding practices exist, just like other traditional knowledge which are both vaguely understood by researchers in rural poultry. Technical interventions often ignore traditional practices. A typical example is the government sponsored program of dissemination of Black Australorp for mating with local chicken, which causes indiscriminate crossbreeding. There is no policy formulated, which defines mating strategies at farm level. We speculate that the observed failure of Black Australorp to survive under rural conditions may mean that the breed does not fit into traditional breeding practices. Currently there is increasing awareness of importance of indigenous practices and the need to include them in development programs aiming at rural poor food security and equity. We have started multiplication programs for rural chickens, pigeons and ducks by setting up village multiplication centres. These centres are managed by farmers using traditional systems.

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